Amendments to the Claims

The following listing of claims replaces all prior versions of the claims and all prior listings of the claims in the present application.

1-26. (canceled)

27. (new) A method of molding and curing a tyre for a vehicle wheel, comprising:

building an unvulcanized tyre on a toroidal support;

heating the toroidal support;

pressing an inner surface of the tyre against an outer surface of the toroidal support; and

pressing an outer surface of the tyre against walls of a molding cavity defined in a vulcanization mold;

wherein a shape of the outer surface of the toroidal support substantially matches that of the inner surface of the tyre,

wherein the toroidal support is heated to transmit heat to the inner surface of the tyre in contact with the toroidal support,

wherein the inner surface of the tyre is pressed against the outer surface of the toroidal support by at least one secondary working fluid under pressure,

wherein the outer surface of the tyre is pressed against the walls of the molding cavity by at least one primary working fluid under pressure,

wherein the at least one primary working fluid passes in at least one diffusion gap between the outer surface of the toroidal support and the inner surface of the tyre, and

wherein the at least one primary working fluid is heated to supply heat to the tyre, causing vulcanization of the tyre.

28. (new) The method of claim 27, wherein the toroidal support is heated using electric resistors.

29. (new) The method of claim 27, wherein the toroidal support is heated using the at least one primary working fluid conveyed into the toroidal support.

30. (new) The method of claim 27, wherein during pressing the inner surface of the tyre against the outer surface of the toroidal support, a pressure of the at least one secondary working fluid is greater than a pressure of the at least one primary working fluid.

31. (new) The method of claim 30, wherein the pressure of the at least one primary working fluid is less than 16 bars.

32. (new) The method of claim 30, wherein the pressure of the at least one secondary working fluid is between 8 bars and 18 bars.

33. (new) The method of claim 27, wherein during pressing the outer surface of the tyre against the walls of the molding cavity, a pressure of the at least one primary working fluid is between 18 bars and 35 bars.

34. (new) The method of claim 27, wherein a temperature of the at least one primary working fluid is greater than or equal to about 170° C and less than or equal to about 210° C.

35. (new) The method of claim 27, wherein the at least one primary working fluid comprises steam, nitrogen, or steam and nitrogen.

36. (new) The method of claim 27, wherein pressing the inner surface of the tyre against the outer surface of the toroidal support comes before heating the toroidal support.

37. (new) The method of claim 27, wherein pressing the inner surface of the tyre against the outer surface of the toroidal support comes after heating the toroidal support.

38. (new) The method of claim 27, wherein pressing the inner surface of the tyre against the outer surface of the toroidal support takes place substantially simultaneously with heating the toroidal support.

39. (new) The method of claim 27, further comprising:

transmitting heat to an external surface of a bead region of the tyre.

40. (new) An apparatus for molding and curing a tyre for a vehicle wheel, comprising:

an airtight vulcanization mold;

at least one passage device;

a feeding device;

first heating devices; and

second heating devices;

wherein the vulcanization mold is arranged to receive a toroidal support adapted to support an unvulcanized tyre within a molding cavity of the vulcanization mold,

wherein the at least one passage device is formed through the toroidal support,

wherein the at least one passage device opens onto an outer surface of the toroidal support,

wherein the at least one passage device is adapted to feed at least one primary working fluid under pressure, enabling passage of the at least one primary working fluid towards an inner surface of the tyre,

wherein the feeding device supplies at least one secondary working fluid under pressure,

wherein the feeding device is operatively associated with the vulcanization mold to press the tyre from an outside of the tyre to an inside of the tyre onto the outer surface of the toroidal support,

wherein the first heating devices heat the toroidal support, and

wherein the second heating devices heat the at least one primary working fluid to supply heat to the tyre, causing vulcanization of the tyre.

41. (new) The apparatus of claim 40, wherein the feeding device comprises:

at least one delivery duct; and

one discharge duct.

42. (new) The apparatus of claim 40, wherein the at least one primary working fluid is used to heat the toroidal support.

43. (new) The apparatus of claim 40, wherein the first heating devices comprise electric resistors.

44. (new) The apparatus of claim 40, wherein the vulcanization mold comprises:

a lower half;

an upper half;

at least one circumferential seal; and

a plurality of other seals;

wherein the lower half is engaged with a base,

wherein the upper half is engaged with a closing portion,

wherein the at least one circumferential seal is disposed on opposite surfaces of the lower and upper halves, and

wherein the plurality of other seals is disposed close to vents for releasing the at least one primary working fluid.

45. (new) An apparatus for molding and curing a tyre for a vehicle wheel, comprising:

a vulcanization mold;

at least one passage device;

a feeding device;

first heating devices;

second heating devices; and

an airtight device arranged to receive a toroidal support;

wherein the vulcanization mold is arranged to receive the toroidal support adapted to support an unvulcanized tyre within a molding cavity of the vulcanization mold,

wherein the at least one passage device is formed through the toroidal support,

wherein the at least one passage device opens onto an outer surface of the toroidal support,

wherein the at least one passage device is adapted to feed at least one primary working fluid under pressure, enabling passage of the at least one primary working fluid towards an inner surface of the tyre,

wherein the feeding device supplies at least one secondary working fluid under pressure,

wherein the feeding device is operatively associated with the airtight device for pressing the tyre from an outside of the tyre to an inside of the tyre onto the outer surface of the toroidal support,

wherein the first heating devices heat the toroidal support, and

wherein the second heating devices heat the at least one primary working fluid to supply heat to the tyre, causing vulcanization of the tyre.

46. (new) The apparatus of claim 45, wherein the airtight device comprises:

a lower half;

an upper half; and

at least one circumferential seal;

wherein the lower half is engaged with a base,

wherein the upper half is engaged with a closing portion, and

wherein the at least one circumferential seal is disposed on opposite surfaces of the lower and upper halves.

47. (new) The apparatus of claim 45, wherein the feeding device comprises:

at least one delivery duct; and

one discharge duct.

48. (new) The apparatus of claim 45, wherein the airtight device comprises at least one duct for feeding the at least one primary working fluid.

49. (new) The apparatus of claim 45, wherein the first heating devices comprise electric resistors.

50. (new) The apparatus of claim 45, wherein the airtight device comprises:

at least one third heating device for supplying heat to an external surface of the tyre.

51. (new) The apparatus of claim 50, wherein the at least one third heating device comprises electric resistors.

52. (new) The apparatus of claim 45, wherein the airtight device comprises at least one duct for feeding the at least one primary working fluid,

wherein the airtight device comprises at least one third heating device for supplying heat to an external surface of the tyre, and

wherein the at least one third heating device is powered by the at least one primary working fluid.